

REMARKS

This paper is presented in response to the non-final official action dated January 23, 2008. Applicants hereby petition for an extension of time to file the response, and submit herewith the appropriate fees, together with an authorization for the Commissioner to charge any deficiencies. Claims 32, 33, 43, and 49-61 are pending. Claim 53 has been amended to depend from claim 51 and recite an average particle size of 50 nm, support being found in Example 3.

Claim Rejections – 35 USC § 112

Claims 33, 43, and 49-61 were rejected under 35 USC § 112, ¶2, as indefinite on the basis that the term “the composition” in claims 33, 43, and 49-69 [sic] lacks antecedent basis.

Claims 33, 43, and 49-61 have been amended to recite the “ceramic or dental material or dental product” in place of “the composition.” Accordingly, the rejections can be withdrawn.

Claim Rejections 35 USC § 102 and 103

Claims 32, 33, 43, and 49-61 were rejected under 35 USC § 102(a), 102(b) or 102(e) as anticipated or in the alternative under 35 USC § 103(a) as obvious over various references.

The official action acknowledges that the claimed bimodal powders are not disclosed in the references, but that the “claims are directed to the sintered body, not the starting materials” and that the patentability of a product does not depend on its method of production. The official action then quotes from MPEP 2113, stating that “[o]nce the examiner provides a rationale tending to show that the claimed product appears to be the same or similar to that of the prior art, although produced by a different process, the burden shifts to applicant to come forward with evidence establishing an unobvious difference between the claimed product and the prior art product.”

It is respectfully submitted that in view of the foregoing amendments and the following comments, the basis for the rejection no longer exists, as the claims explicitly recite the special feature reciting from the claimed process. In addition or in the alternative, the rejection is overcome in view of the evidence presented in the specification showing that the

monomodal prior art compositions would not necessarily possess the unexpected, superior characteristics attributed to the claimed compositions.

The ceramic according to the present invention, which is made of a metal oxide powder with a bimodal size distribution, has a special structure comprising two different phases resulting from its production method and especially from the starting materials (bimodal powder), which are used. See, e.g., page 10, lines 10-16, and claim 17 as filed ("the ceramics that can be made from the bimodal metal oxide powders according to the invention generally have a bimodal particle size distribution, whereby (1) a first phase comprises a metal oxide . . . and (2) a second phase comprises a metal oxide" Independent claim 32 has been amended to make this feature explicit.

The person of ordinary skill in the art would readily understand that a ceramic according to the invention is thus a polycrystalline material comprising different grains with different grain sizes, whereby one phase or part of the ceramic comprises grains with a first average size and the other phase or part of the ceramic comprises grains with a second average size.

These metal oxide grains or particles or crystallites comprised by the ceramic are thereby actually individual small crystals differing by the orientation of their individual crystal lattice.

This means that by observing the actual structure of the ceramic, two different phases or two different parts of the ceramic according to the present invention differing by the grain size found in each phase or part may be determined.

This special structure comprising two different phases sets a ceramic according to the present invention clearly apart from the known ceramics cited in the official action, since none of these documents discloses a ceramic having a structure comprising two different phases.

In the interest of advancing prosecution, this feature has been made explicit in claim 32, to help to clarify the difference between the invention and the prior art.

Moreover, claim 32 has also been amended, without prejudice, to reduce the upper limit of the average particle size of the second nanoscale powder (b) to the preferred value of 100 nm. Support is found in originally-filed claim 9, for example.

As amended, since powder (a) has an average particle size of $0.2\text{ }\mu\text{m} = 200\text{ nm}$ to $12\text{ }\mu\text{m}$ and powder (b) now has an average particle size of 10 nm to 100 nm , the case in which both phases have an average grain/particle/crystallite size of 250 nm is thus now explicitly excluded in the claims.

The ceramic according to the present invention is thus clearly set apart from the ceramics cited in the official action by its special structure comprising two different phases. None of the documents cited in the official action discloses a ceramic comprising two different phases.

Moreover, none of the documents cited in the official action suggest that a ceramic made of a bimodal metal oxide powder and thus having a special structure comprising two different phases, like those according to the present invention, may result in a specially high bending strength.

In this respect, see the examples of the present invention (example 3 and comparative example 1), which clearly indicate that a ceramic prepared with a bimodal metal oxide powder and thus having a special structure comprising two different phases, like those according to the present invention, have a highly increased bending strength compared to a ceramic obtained using a monomodal metal oxide powder.

In particular, the monomodal composition of Example 1 (the comparative example) made from ZrO_2 powder stabilized with 3 mole % Y_2O_3 and having an average particle size of 620 nm had a three-point bend strength of 1149 MPa , whereas the composition of Example 3 made from the powder of Example 1 and a 3 mole % Y_2O_3 -stabilized ZrO_2 powder having an average particle size of 620 nm (from Example 2) had a three-point bend strength of 1473 MPa . This increase of more than 25% bend strength was obtained while the density of the two products was held nearly identical (6.08 g/cm^3 vs. 6.08 g/cm^3). Furthermore, as described in Example 3, the composition of the invention was more translucent than the composition of the comparable example.

Such an effect of the use of a special structure comprising two different phases with different grain/particle/crystallite sizes resulting from the use of a bimodal metal oxide powder to produce the ceramic according to the present invention could not be expected by someone skilled in the art, as there is no indication of such an effect in the documents cited in the official action. It is submitted that the evidence already contained in the specification

thus supports an unobvious difference between the claimed product and the prior art, and thus overcomes the rejections.

A ceramic according to the amended claims is thus novel and not obvious compared to the state of the art.

Should the examiner wish to discuss the foregoing, or any matter of form or procedure in an effort to advance this application to allowance, the examiner is urged to telephone the undersigned attorney at the indicated number.

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